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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/706,472 | 11/10/2003 | Thomas James Batzinger | RD-28,303-1 | 6737 |

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

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| EXAMINER |
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SMITH, NICHOLAS A

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| ART UNIT | PAPER NUMBER |
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1742

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 12/22/2006 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/706,472

Applicant(s)

BATZINGER ET AL.

Examiner

Nicholas A. Smith

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of Claims

1. Claims 1-21 remain for examination.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 8, 10-12, 15, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Li et al. (US Patent 6,355,156) as submitted by applicant in information disclosure statement on 11/10/2003.
4. In regards to claims 1-2, 8, 10-12, 15, 18 and 20, Li et al. is applied to the claims for the same reasons as stated on pp. 2-4 of the previous office action.
5. In regards to amendment "synchronizing the excitation of the ultrasonic sensor to a machining cycle of the electrochemical machining (ECM) tool, the synchronizing comprising" in claims 1, 12 and 15, Li et al. does not specifically disclose an active step of synchronizing the sensor to a machining cycle of the ECM tool. However, synchronizing is inherent in operation of the ultrasonic sensor with the ECM tool in that excitation of the ultrasonic tool is suggested during the off time interval of pulsed electrochemical machining (col. 5, lines 40-45). Multiple measurements of the ultrasonic sensor would be inherently made in that the ultrasonic sensor is used in a method of ECM monitoring, and thus requiring multiple thickness measurements (claim

1, abstract). Therefore, Li et al. inherently disclose a method of synchronizing the excitation of the ultrasonic sensor to a machining cycle (pulsed ECM).

6. In regards to amendment "such that the exciting and receiving are preformed during a plurality of machining off-times" in claims 1, 12 and 15, Li et al. discloses operation of the ultrasonic sensor during machining off-times (off cycle of pulsed ECM, col. 5, lines 40-45). While a plurality of ultrasonic measurements are not specifically disclosed, Li et al. inherently discloses making multiple measurements of the ultrasonic sensor in that the ultrasonic sensor is used in a method of ECM monitoring, and thus requiring multiple thickness measurements (claim 1, abstract). Furthermore, it is well understood that pulsed ECM has multiple off-time cycles.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3, 9, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al.

9. In regards to claims 3 and 19, Li et al. does not specifically teach repeating reducing the potential difference across the electrode and the workpiece or using a pulsed power supply to generate a series of measurement periods. Since reducing the potential difference or being in a pulse-off state minimizes the generation of bubbles (col.5, lines 40-45), which consequently improves the accuracy of measurement, it

Art Unit: 1742

would have been obvious to one of ordinary skill in the art to make multiple measurements in order to improve the accuracy of the measurement, especially considering that accuracy improves as potential difference is reduced or is in a pulse-off state.

10. In regards to amendment "synchronizing" in claim 3, Li et al. inherently discloses synchronizing as stated above in paragraph 5.

11. In regards to claims 9 and 21, Li et al. does not specifically disclose the use of at least two ultrasonic sensors, the second ultrasonic delaying the excitation by a dwell time plus an offset of at least the time required to attenuate the ultrasonic wave from the first ultrasonic sensor.

12. While Li et al. only specifically discloses one ultrasonic sensor to monitor the gap distance of one side of an airfoil in an electrochemical machining process (abstract, Figure 1), Li et al. does disclose two sides of an airfoil to be electrochemically machined (Figures 1 and 2). It would have been obvious to one of ordinary skill in the art to modify Li et al.'s electrochemical machining process to employ a second ultrasonic sensor on the second side of an airfoil in order monitor the gap distance of the second side of an airfoil (Li et al., abstract). Furthermore, with such a modification, Li et al. would teach exciting a first ultrasonic sensor to direct an ultrasonic wave towards a surface of one of the electrodes and exciting a second ultrasonic sensor to direct an ultrasonic wave toward a surface of another of the electrodes. Furthermore, including an offset time between ultrasonic sensor signal excitation is a necessary adjustment

Art Unit: 1742

inherent to a control system employing multiple emitting/receiving sensors in order to avoid attenuation or interference.

13. Claims 3-7, 13-14, 16-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. in view of Klocke et al. (US 2003/0079989).

14. In regards to claims 3-7, 13-14, 16-17 and 19, Li et al. in view of Klocke et al. is applied to the claims for the same reasons as stated on pp. 4-5 of the previous office action.

Response to Arguments

15. Applicant's arguments filed 12 October 2006 have been fully considered and are persuasive in parts and they are not persuasive in other parts.

16. Applicant argues:

- a. Li et al. does not teach synchronizing.
- b. Li et al. does not disclose means for accomplishing a synchronizing of a dwell time.
- c. Klocke et al. does not address the upper limit of the claimed dwell time.
- d. Raulerson et al. (US Patent 5,672,263) does not teach exciting a first ultrasonic sensor to direct an ultrasonic wave towards a surface of one of the electrodes and exciting a second ultrasonic sensor to direct an ultrasonic wave toward a surface of another of the electrodes.

17. Examiner responds:

- a. See reasons stated above in paragraphs 5-6.

Art Unit: 1742

b. Since the measurement using the ultrasonic sensor is made after generation of gas bubbles is lessened by a decrease in potential difference or in the pulse-off state of a pulsed power supply (col. 5, lines 40-45), there is an inherent delay (i.e., a dwell time) between the decrease in DC voltage and measurement made by ultrasonic sensor due to the inherent time it takes to transmit electronic signals. Therefore, a dwell time would be inherent to the method disclosed by Li et al. and therefore a means to synchronize a dwell time is inherently disclosed.

c. See p. 5 of the previous office action. Bubble minimization is necessary thus a results effective variable (Klocke, paragraphs [0076]-[0077]). See MPEP 2144.05 II. Furthermore, bubbles have an inherent amount of time to leave the surface of a workpiece and thus such a dwell time would need to be optimized to result in bubble minimization.

d. Examiner agrees that Raulerson et al. does not teach the claimed element. Please see new rejection ground stated above in paragraphs 11-12.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

19. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

Art Unit: 1742

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas A. Smith whose telephone number is (571)-272-8760. The examiner can normally be reached on 8:30 AM to 5:00 PM, Monday through Friday.

21. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571)-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

22. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ROY KING
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